

TUNABLE INDICATING AMPLIFIER

45 cps to 600 kc
non-resonant
or
tunable



A null detector for bridges; usable also as an amplifier or variable filter

Specifications

► Order Number BN 12121/2

Frequency range	45 cps to 600 kc, in 5 ranges
Types of operation	tuned and flat broadband response (with and without indication)
Bandwidth in tuned operation	about 1% to 10%, adjustable
Sensitivity in tuned operation	about 3 μ v
with a bandwidth of 2% and $\frac{1}{10}$ of f.s.d. of meter	
Maximum input voltage	100 v rms, approx.
Calibration of meter	approx. linear up to mid-scale, thereafter progressively crowded
Gain in broadband operation	approx. $3 \cdot 10^3$, total
Gain in tuned operation	same as above plus continuous adjustment up to approx. $3 \cdot 10^5$ by feedback
Gain control	by input attenuator in 5 10:1 steps
Input and output terminals	single-ended, 13-mm socket; connection of banana plug also possible
Input impedance	1 M Ω in shunt with about 30 μ f
Output impedance	10 k Ω , approx.
Distortion of the output voltage	less than 1 % up to 400 kc
amplifier operating without indication	less than 1.5 % up to 600 kc
and with output voltages of less than 5 v	
Hum voltage referred to the input	approx. 2 μ v in the most sensitive range
Power supply	115/125/220/235 v, 47 to 63 cps (30 va)

Dimensions

470 x 275 x 260 mm (R&S Standard Cabinet 46)

Weight

15 kg

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Data sheet
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TUNABLE INDICATING AMPLIFIER UBM

Uses

The Tunable Indicating Amplifier Type UBM is a very versatile instrument because it covers a voltage range from 3 μv to 100 v and a frequency range from 45 cps to 600 kc. It is used in audio and carrier-frequency engineering, especially where high spurious voltages (harmonics, hum) are present and where no absolute but only relative voltage measurements are necessary over a wide range; for example, in the measurement of high attenuations and in similar substitution methods. Moreover, it may be employed for minimum indication, say in the neutral arm of a bridge. It is then unimportant whether the oscillator feeding the bridge delivers a sinusoidal or distorted voltage; a sharp and definite minimum will be obtained in any case and the accuracy of the bridge will thus be fully utilized. Feedback adjustment permits the spurious voltages to be suppressed more than 1:100 by emphasis of the fundamental wave. The instrument has further applications as a wave analyzer or as a narrow filter adjustable in frequency and bandwidth, the signal being amplified at the same time. In addition, the Tunable Indication Amplifier UBM can be switched from tuned to broadband operation. It then has all the properties of a broadband amplifier.

Description

The Tunable Indicating Amplifier Type UBM is a three-stage amplifier with a panel meter. A resistive voltage divider with five 10:1 steps lies ahead of the first stage. The second stage has a feedback loop comprising a three-section RC network, the frequency of which is adjustable. This makes the amplifier selective. By adjusting the valve amplification, the feedback can be varied until oscillations start. It is possible to switch the feedback loop out of circuit; the amplifier then operates broadband. In operation without indication, the final stages operates linearly. In operation with indication, however, it is no longer linear, the scale being progressively crowded. The voltage range of more than 1:30 covered without range switching facilitates balancing of test bridges.

The first three stages are d-c heated and the anode supply is regulated. It is thus possible to obtain stable, high feedback ratios, and the full sensitivity remains available even when one tunes to the a-c supply frequency.

The Tunable Indicating Amplifier Type UBM usually comes in a steel cabinet with handles and a front cover. However, it can also be accommodated in an R&S Test Rack Type 450 if the cabinet is replaced by the dust cover.

Valve complement: 4 x EF 80, 1 x STV 150 C 2

We reserve the right to make any departures from this specification, especially those considered desirable for reasons of improved design.